

CLAIMS

What is claimed is:

1. An autonomous mooring device comprising:
 - a combination air brake/anchor comprising a plurality of mooring arms and a parachute attached to the plurality of mooring arms;
 - a mooring module attached to the air brake/anchor; and
 - a floatation buoy attached to an end of the mooring line.
2. The mooring device of claim 1, wherein the mooring device is operable between a plurality of operational states comprising:
 - a first operational state wherein the air brake/anchor is in a compact, stowed position, and the air brake/anchor, the mooring module and the flotation buoy in a deflated state, are contained within a cylinder;
 - a second operational state wherein the air brake/anchor, the mooring module and the buoy are deployed from the cylinder, the air/break anchor, mooring module and buoy are all rigidly attached, and the air brake/anchor is in an expanded operational position to effectuate air braking; and
 - a third operational state wherein air/break anchor, mooring module and buoy are deployed, further wherein the buoy is attached to the mooring module using a first cable and the mooring module is attached to the air brake/anchor using a second cable, and the buoy is inflated to be buoyant.
3. The mooring device of Claim 1, wherein the mooring arms comprise a plurality of linked arm segments, the mooring arms being foldable at joints of the linked arm segments to enable the air brake/anchor to be folded into a compact, stowed position.

4. The mooring device of Claim 3, wherein the mooring arms further comprise springs connected to adjacently positioned linked arm segments to facilitate deploying the air brake/anchor from the compact, stowed position to an expanded, deployed position.
5. The mooring device of Claim 1, wherein the mooring line comprises a structural member.
6. The mooring device of Claim 5, wherein the mooring line includes at least one conductor.
7. The mooring device of Claim 1, wherein the parachute is attached to at least an end of a plurality of the mooring arms and a structure of the parachute in a deployed position is defined generally by a structure of the plurality of mooring arms in an extended position.
8. The mooring device of Claim 1, wherein the mooring line is contained within a mooring line module.
9. The mooring device of Claim 8, wherein the mooring line module further comprises:
 - a mooring line spool;
 - a module housing;
 - a mooring line;
 - a line feed disk; and
 - a line locking mechanism,wherein the mooring line is fed out from the mooring line spool through the line feed disk.

10. The mooring device of Claim 9, wherein the mooring line module further comprises an electronics system, the electronics system comprising:

a magnet coupled to the line feed disk; and
a hall sensor;

wherein the line feed rotates as the mooring line is released from the mooring line module, and the hall sensor is used to detect each rotation to determine an amount of the mooring line which is released.

11. The mooring device of Claim 9, wherein the mooring line module further comprises an electronics system, the electronics system comprising:

a pressure sensor;

wherein the pressure sensor provides a measure of depth of the mooring line module within a fluid.

12. An anchor comprising:

a plurality of mooring arms;

wherein the plurality of mooring arms comprise a plurality of linked arm segments, the mooring arms being foldable at joints of the linked arm segments to enable the anchor to be folded into a compact, stowed position.

13. The anchor of Claim 12, wherein the mooring arms further comprise springs connected to adjacently positioned linked arm segments to facilitate deploying the anchor from the compact, stowed position to an expanded, deployed position.

14. A combination anchor/air brake comprising:

- a plurality of mooring arms; and
- a parachute attached to at least an end of a plurality of the mooring arms;
- wherein the plurality of mooring arms comprise a plurality of linked arm segments, the mooring arms being foldable at joints of the linked arm segments to enable the anchor to be folded into a compact, stowed position;
- further wherein a structure of the parachute in a deployed position is defined generally by a structure of the plurality of mooring arms in an extended position.

15. The anchor of Claim 14, wherein the mooring arms further comprise springs connected to adjacently positioned linked arm segments to facilitate deploying the anchor from the compact, stowed position to an expanded, deployed position.

16. A mooring line module comprising:

- a mooring line spool;

- a module housing;

- a mooring line;

- a line feed disk; and

- a line locking mechanism,

wherein the mooring line is fed out from the mooring line spool through the line feed disk.

17. The module of Claim 16, wherein the mooring line module further comprises an electronics system, the electronics system comprising:

a magnet coupled to the line feed disk; and
a hall sensor;

wherein the line feed rotates as the mooring line is released from the mooring line module, and the hall sensor is used to detect each rotation to determine an amount of the mooring line which is released.

18. The module of Claim 16, wherein the mooring line module further comprises an electronics system, the electronics system comprising:

a pressure sensor;

wherein the pressure sensor provides a measure of depth of the mooring line module within a fluid.

19. A flotation buoy comprising:

a buoy;

wherein the buoy has a ratio of length to width of greater than about 2:1 thereby reducing drag on the buoy when placed in a body of water.

20. The flotation buoy of Claim 19, wherein the buoy has a shaped lateral cross-section such that, when the buoy is inflated with an inflation gas, a higher percentage of the inflation gas is in an upper half of the buoy and a lower percentage of the inflation gas in a lower half of the buoy.

21. The flotation buoy of Claim 19, further comprising a stabilization means attached to the buoy to provide additional stability of the buoy in currents.

22. The flotation buoy of Claim 19, wherein the buoy has a reduced drag that is less than about 35% of a drag for a buoy having a circular cross-section.

23. A release mechanism for releasing an anchor attached to another device comprising:

a mooring release for releasing the anchor from the other device; and
release means for activating the mooring release upon contact with water.

24. The release mechanism of Claim 23, wherein the release means comprises at least one chemical pill that dissolves in contact with water.

25. The release mechanism of Claim 23, further comprising a compression ejection spring to help release the anchor from the other device.